Published in final edited form as:

J Community Psychol. 2011 March 1; 39(2): 231–239. doi:10.1002/jcop.20422.

SCREENING FOR AND PREVALENCE OF HIV AND HEPATITIS C AMONG AN OUTPATIENT URBAN SAMPLE OF PEOPLE WITH SERIOUS MENTAL ILLNESS AND CO-OCCURRING SUBSTANCE ABUSE

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Abstract

Background—To assess rates of screening and testing of HIV and HCV among those with serious mental illness and co-occurring substance use disorders.

Methods—One hundred fifty-three people with serious mental illness and cooccurring substance use disorders completed measures and were screened for HIV and HCV.

Results—Six percent were HIV positive and 25% were HCV positive. Almost a quarter reported a history of injection drug use and 86% reported a history of unprotected sexual encounters. Compared to those without a diagnosis of Hepatitis C, those diagnosed with Hepatitis C were significantly more likely to have a sexually transmitted infection, ($p = 0.01$), have a lifetime history of injection drug use, ($p < 0.001$), and a lifetime history of sniffing drugs, ($p = 0.01$).

Conclusions—Given the high levels of infection of HIV and HCV and high levels of transmission risk factors efforts to improve screening and provide risk reduction counseling are warranted.

INTRODUCTION

Compared with the general population, people with serious mental illness (SMI) appear to be at increased risk of being infected with HIV and HCV. The prevalence of HIV among individuals with serious mental illness ranges between 1%–23% (Cournos et al., 1991; Empfield et al., 1993; Himmelhoch et al., 2007; Lee, Travin, & Bluestone, 1992; Meyer, 2003; Rosenberg, Drake, Brunette, Wolford, & Marsh, 2005; Sacks, Dermatis, Looser-Ott, & Perry, 1992; Silberstein et al., 1994; Susser, Valencia, & Conover, 1993; Volavka et al., 1992), while the prevalence of HCV ranges between 8.5% to 30% (Dinwiddie, Shicker, & Newman, 2003; Dominitz et al., 2005; Himmelhoch et al., 2009; Klinkenberg et al., 2003; Meyer, Pirl, Greer, Weissgarber, Liverant, & Safren, 2005; Rosenberg et al., 2001). These rates are significantly higher than the prevalence of HIV (0.3%) and the prevalence of HCV (1.8%) found in the general population (Alter et al., 1999, 2001). Risk factors associated with being infected with HIV and HCV among those with serious mental illness include unprotected sex and injections drug use (Himmelhoch et al., 2007, 2009; Meade & Sikkema, 2005; Senn & Carey, 2008).

A recent review by Senn and Carey (2009) regarding HIV testing among those with serious mental illness found that less than half (17%–48%) of people with serious mental illness at risk for HIV were tested in a given year. This is important as the Centers for Disease Control and Prevention (CDC) recommends annual HIV testing for those at high risk for being infected with HIV (Branson et al., 2006). Furthermore, Goldberg et al. (2005) found that among those with serious mental illness less than half (41%) ever received HCV testing. Although there are clear guidelines and health mandates to screen for HIV and viral hepatitis (U.S. Department of Health and Human Service, 2000, 1998; Branson et al.) these critical public health recommendations are not routinely provided to those with serious mental illness and are rarely implemented in the mental health systems of care (Brunette, Drake, Marsh, Torrey, & Rosenberg, 2003; Rosenberg et al., 2005; Satriano, McKinnon, & Adoff, 2007; Senn et al., 2009; Solomon et al., 2007; Swartz et al., 2003; Walkup, Satriano, Hansell, & Olfson, 1998). This is particularly important as people with serious mental illness may rely on the mental health system to provide basic medical services (Chwastiak, Rosenheck, & Kazis, 2008; Druss & von Esenwein, 2006; Druss & Newcomer, 2007; Zeber, Copeland, McCarthy, Bauer, & Kilbourne, 2009).

Almost a decade ago we reported a 5% prevalence rate of HIV and a 20% prevalence rate of HCV among serious mental illness receiving outpatient mental health care in an urban community in the mid-Atlantic region of the United States (Rosenberg et al., 2001). As early detection of HIV and HCV may reduce transmission rates and significantly improves health outcomes (Fenton, 2007; Maheshwari, Ray, & Thuluvath, 2008) and given the call for increased screening for these diseases (Osher et al., 2003; Rosenberg et al., 2001), our aim is to provide more current estimates of the prevalence of HIV and HCV and risk factors associated with infectious disease.

METHOD

Sample and Setting

We used baseline data from a stage 2 randomized control trial evaluating the efficacy of a brief intervention called STIRR, which stands for *screening* and *testing* for HIV and hepatitis C virus, *immunization* for hepatitis A and B virus, *risk-reduction* counseling and

medical treatment *referral* to infectious disease medical follow-up, versus enhanced treatment as usual targeting people with serious mental illness and co-occurring substance use disorders receiving psychiatric care in urban publicly funded mental health treatment settings (Rosenberg et al., 2010). Two hundred and thirty-six participants aged 18–65 years, with a lifetime diagnosis of a substance use disorder and a chart diagnosis of a serious mental illness (i.e., a schizophrenia spectrum disorder, major depressive disorder, or bipolar affective disorder), were recruited from four community mental health clinics within the Baltimore-metro area. One hundred and eighteen were randomized to receive STIRR and 118 were randomized to receive enhanced treatment as usual. All participants randomized to enhanced treatment as usual were offered the STIRR intervention at study completion. Of the 118 people who were randomized to receive enhanced treatment as usual, 35 (30%) also requested to receive the STIRR intervention. Only those who received the STIRR intervention ($n = 153$ [$n = 118$ randomized to STIRR1 + $n = 35$ randomized to enhanced treatment as usual who requested to receive STIRR at study completion]) received HIV and HCV testing. These 153 participants were included in the sample for this study. The study was approved by the University of Maryland Baltimore's and Dartmouth University's Institutional Review Boards and all participants provided informed consent.

Measures and Assessments

Sociodemographic characteristics, infectious disease screening history, and engagement in high-risk behaviors, including IV drug use and unprotected sexual activity and substance use patterns, were assessed at the study baseline using the following assessments.

General health services and prescription medicines—The use of medical services and amount of medical care received were reviewed, and most items were drawn from either the National Health Interview Survey (NHIS; U.S. Department of Health and Human Services, 1998; National Center for Health Statistics, 1998) or the National Health and Nutrition Examination Survey (NHANES-III; U.S. Department of Health and Human Services, 1998).

AIDS Risk Inventory (Modified)—A structured interview for assessing knowledge, attitudes, and risk behaviors associated with acquiring and transmitting bloodborne infections. We included specific items on hepatitis. Previous studies using the AIDS Risk Inventory (ARI) with SMI respondents found that it is reliable and valid (Chawarski, Pakes, & Schottenfeld, 1998).

The Dartmouth Assessment of Lifestyle Instrument (DALI)—The DALI is an 18-item questionnaire that comprises 2 scales: current alcohol use disorders and current drug use disorders in people with SMI (Rosenberg et al., 1998).

Laboratory Tests

Serum samples were used to test HIV and HCV. HIV was tested using HIV ELISA and, if positive, a confirmatory Western Blot. HCV was tested using HCV EIA 2.0 (Abbott HCV EIA 2.0, Abbott Laboratories, Abbott Park, IL). Positive HCV screens were verified by the recombinant immunoblot assay (RIBA; Chiron Corporation, Emeryville, CA).

Analysis

Univariate distributions included percentages for dichotomous variables and means for normally distributed continuous variables. Comparison of means was made using two-sided *t* tests, while comparison of percentages was made using the chi-square method. Data were analyzed using SAS (version 9.1). All reported *p* values are two-sided.

RESULTS

Most of the participants were unmarried (64.7%), high school educated (60.1%), African-American (74.7%), men (59.5%). Only 3% were Hispanic ethnicity. Their mean age at baseline was 47 years of age (± 8.1). They reported a mean monthly income of \$690. Homelessness was reported by 6.5% and 69% reported ever being arrested or in jail. With respect to psychiatric diagnoses, 69.9% were diagnosed with either schizophrenia or schizoaffective disorder, 17.0% were diagnosed with bipolar affective disorder, and 13.1% were diagnosed with major depression. Twenty-nine percent of the participants screened positive for a drug or alcohol use disorder. The prevalence of alcohol use disorder was 10.5% and of drug use disorder was 23.5%. The vast majority (90.2%) of the participants reported having a place to go when sick or in need of advice about their health.

Risk Factors for Transmission of HIV and Hepatitis C

Almost a quarter of the participants (24.2%) reported a history of injection drug use. Among those who reported having a history of injection drug use, 92.3% reported a history of sharing needles. Few (7.8%) patients reported sharing a toothbrush or a razor with other individuals.

With respect to sexual transmission, 86.3% reported a history of unprotected sexual encounters, with 28.3% reporting having an unprotected sexual encounter in the last 6 months. Among those reporting having unprotected sex in the last 6 months, 53.3% reported having five or more unprotected sexual encounters. Approximately one quarter (27.5%) of the participants reported ever having sex for food, a place to stay, or money. Finally, 19.8% of men reported ever having sex with a man.

Screening for and Prevalence of HIV and Hepatitis C

Although, 83.2% of the participants reported ever receiving testing for HIV, only a little over half (52.0%) reported ever receiving testing for HCV. Compared with those who did not report being tested for HCV, those who reported being tested for HCV were more likely to report ever shooting drugs ($X^2 = 7.7$, $p = 0.005$) and ever sniffing or snorting drugs ($X^2 = 9.0$, $p = 0.003$). They were also more likely to report ever having a sexually transmitted disease ($X^2 = 5.5$, $p = 0.02$) and having sex for food, a place to stay, or money ($X^2 = 5.3$, $p = 0.02$). Finally they were more likely to report being arrested or having been in jail ($X^2 = 5.0$, $p = 0.03$).

With respect to prevalence of HIV and HCV, 24.8% were infected with HCV and 6.1% were infected with HIV. Among those infected with HIV, 50% were co-infected with HCV. Those with bipolar disorder were the most likely to be infected with hepatitis C (46%), followed by those with depression (35%); while those with psychotic disorders were the least likely to have been infected with hepatitis C (17%). Compared with those without a diagnosis of hepatitis C, those diagnosed with hepatitis C were significantly more likely to have a history of sexually transmitted infections ($X^2 = 6.2$, $p = 0.01$), have a lifetime history of injection drug use ($X^2 = 38.8$, $p < 0.001$), and a lifetime history of sniffing/snorting drugs ($X^2 = 6.1$, $p = 0.01$).

DISCUSSION

Among a sample of individuals with co-occurring serious mental illness and a history of a substance use disorder receiving mental health treatment in an urban setting, 6.1% tested positive for HIV and 24.8% tested positive for HCV. These estimates are nearly identical to those found by our study group nearly a decade ago (Rosenberg et al., 2001). Our estimates also fall within the previously reported range of estimates of HIV prevalence (1%–23%;

Cournos et al., 1991; Empfield et al., 1993; Himelhoch et al., 2007; Lee et al., 1992; Meyer et al., 1993; Rosenberg et al., 2001; Sacks et al., 1992; Silberstein et al., 1994; Stewart, Zuckerman, & Ingle, 1994; Susser et al., 1993; Volavka et al., 1992) and within previously reported range of estimates of HCV prevalence (8.5 to 30; Dinwiddie et al., 2003; Dominitz et al., 2005; Himelhoch et al., 2009; Klinkenberg et al., 2003; Meyer; Pirl et al., 2005; Rosenberg et al., 2001). These rates are significantly higher than the prevalence of HIV (0.3%) and the prevalence of HCV (1.8%) found in the general population (Alter et al., 1999, 2001).

Although those with serious mental illness continue to be at high risk for being infected with HIV, the risk may not be shared by all subgroups equally. We found that those with bipolar disorder were the most likely to be infected with HCV, while those with psychotic disorders were the least likely to be infected with HIV. One recent study among veterans found that those with bipolar disorder and co-occurring substance use were significantly more likely to have a recorded diagnoses of HCV compared with those with schizophrenia and substance use disorders (Himelhoch et al., 2009). Furthermore, another study among veterans found that those with schizophrenia without substance use were significantly *less* likely to have a recorded diagnosis of HIV compared with patients with neither schizophrenia nor substance use (Himelhoch et al., 2007). These studies suggest that moderating factors such as substance use as well as symptoms specifically associated with schizophrenia (e.g., negative symptoms) may be important in providing a more nuanced understanding regarding the relationship between diagnosis and risk of infection with HIV and HCV among those with serious mental illness.

Many of the participants in the study endorsed behaviors associated with increased risk of being infected with HIV and HCV. For example, 86.3% reported having unprotected sexual encounters, and nearly one in three reported having unprotected sexual encounters in the last 6 months. Nearly one quarter of the participants reported using injection drugs in their lifetime, and more than 9 in 10 reported sharing needles. As an indication of the vulnerability of this group, nearly a quarter reported having sex in exchange for food, a place to stay, or money.

With respect to previous testing, nearly 8 of 10 reported being tested for HIV. This is in contrast to only 5 of 10 reported being tested for HCV. These findings are similar to our previous studies that suggest that testing for HCV is still underutilized in this high-risk sample (Goldberg et al., 2005). This is particularly important as the risk for HCV in our sample was over 10 times that of the general population. Of note, it appears that those who did report receiving an HCV test were those who were at higher risk of being infected with HCV, including those who use injection drugs, those who have been to prison, and those who may have had multiple partners as evidenced by reporting they have had sex for food, a place to stay, or money. Finally, it is important to note that we found that risk factors associated with being diagnosed with HCV were similar to those found in the general population.

Limitations

As the results are based on a convenience sample of patients receiving mental health services from an urban locale, they may not generalize to the population of patients with serious mental illness in general. Although the prevalence of HIV among the participants of our study was nearly 20 times that of the general population, we did not have enough power to determine risk factors associated with being diagnosed with HIV.

Implications

Over the last decade the prevalence of HIV and HCV in an urban clients with serious mental illness and substance use disorders continues to be high. Although the vast majority of the patients in our sample report ever being screened for HIV, only half report ever being screened for HCV. Given the high levels of infection of HIV and HCV among individuals with serious mental illness and high levels of reported transmission risk factors, continued efforts to improve screening as well as provide risk reduction counseling for this vulnerable population are warranted. STIRR is a brief, manualized intervention that is designed to be delivered to people with serious mental illness at the site of mental health care. Results of a randomized control trial (Rosenberg et al., 2010) found that compared to those randomized to receive enhanced treatment as usual, those randomized to the STIRR intervention were more likely to be tested for HIV and HCV, had increased HCV knowledge, and reduced substance abuse. Over 80% of STIRR participants infected with HCV were successfully referred to care. Intervention costs were \$541 per client. Given the modest cost of the intervention and the potentially high public health impact, future efforts to implement STIRR should be strongly considered.

The logical place to implement STIRR in the United States would be within the network of community mental health centers. Community mental health centers were initially conceived as providing outpatient mental health care in close collaboration with the general medical system of care (Druss, 2002). This collaborative model, however, was largely unrealized because of financial limitations, lack of insurance coverage, and weak organizational ties between somatic and mental health systems of care (Druss). As people with serious mental illness continue to rely more and more on the mental health system to provide basic medical services (Chwastiak et al., 2008; Druss & von Esenwein, 2006; Druss & Newcomer, 2007; Zeber et al., 2009), community mental health centers, which are the largest providers of mental health care for the public sector in the United States, will, by necessity, need to reclaim their historical ties with somatic medicine (Srihari, Tek, Chwastiak, Woods, & Steiner, 2007; Druss et al., 2008). Leaders of community mental health centers clearly recognize the need for implementing preventative medical services including HIV and HCV screening, but financial barriers, workforce limitations, and space constraints continue to be barriers to implementing these needed services (Druss et al.). Future strategies directed at improving implementation and overcoming these barriers will be necessary for successful implementation to occur.

Acknowledgments

Supported by the National Institutes of Drug Abuse (K23 DA019820) and National Institutes of Mental Health (R01MH 072556).

REFERENCES

- Alter MJ, Druszon-Moran D, Nainan OV, McQuillan GM, Gao F, Moyer LA. The prevalence of hepatitis C in the United States, 1988 through 1994. *New England Journal of Medicine*. 1999; 341:556–562. [PubMed: 10451460]
- Branson BM, Handsfield HH, Lampe MA, Janssen RS, Taylor AW, Lyss SB, Centers for Disease Control and Prevention. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. *MMWR*. 2006; 55:1–17. [PubMed: 16988643]
- Brunette MF, Drake RE, Marsh BJ, Torrey WC, Rosenberg SD. Responding to blood-borne infections among persons with severe mental illness. *Psychiatric Services*. 2003; 54:860–865. [PubMed: 12773601]
- Centers for Disease Control and Prevention. HIV and AIDS—United States, 1981–2000. *MMWR Prevention: Morbidity and Mortality Weekly Report*. 2001; 50:430–434.

- Chawarski MC, Pakes J, Schottenfeld RS. Assessment of HIV risk. *Journal of Addictive Disease*. 1998; 17:49–59.
- Chwastiak LA, Rosenheck RA, Kazis LE. Utilization of Primary Care by Veterans with Psychiatric Illness in the National Department of Veterans Affairs Health Care System. *Journal of General Internal Medicine*. 2008; 23(11):1835–1840. [PubMed: 18795371]
- Cournos F, Empfield M, Horwath E, McKinnon K, Meyer I, Schrage H, Agosin B. HIV seroprevalence among patients admitted to two psychiatric hospitals. *American Journal of Psychiatry*. 1991; 148(9):125–130.
- Dinwiddie SH, Shicker L, Newman T. Prevalence of Hepatitis C Among Psychiatric Patients in the Public Sector. *American Journal of Psychiatry*. 2003; 160:172–174. [PubMed: 12505819]
- Dominitz JA, Boyko EJ, Koepsell TD, Heagerty PJ, Maynard C, Sporleder JL, Young KA. Elevated prevalence of hepatitis C infection in users of United States veterans medical centers. *Hepatology*. 2005; 41:88–96. [PubMed: 15619249]
- Druss BG. The mental health/primary care interface in the United States: History, structure, and context. *General Hospital Psychiatry*. 2002; 24:197–202. [PubMed: 12100830]
- Druss BG, Marcus SC, Campbell J, Cuffel B, Harnett J, Ingoglia C, Mauer B. Medical services for clients in community mental health centers: Results from a national survey. *Psychiatric Services*. 2008; 59:917–920. [PubMed: 18678690]
- Druss BG, Newcomer JW. Challenges and solutions to integrating mental and physical health care. *Journal of Clinical Psychiatry*. 2007; 68:e09. [PubMed: 17474799]
- Druss BG, von Esenwein SA. Improving general medical care for persons with mental and addictive disorders: Systematic review. *General Hospital Psychiatry*. 2006; 28:145–153. [PubMed: 16516065]
- Empfield M, Cournos F, Meyer I, McKinnon K, Horwath E, Silver M, Herman R. HIV seroprevalence among homeless patients admitted to a psychiatric inpatient unit. *American Journal of Psychiatry*. 1993; 150:47–52. [PubMed: 8417579]
- Fenton KA. Changing epidemiology of HIV/AIDS in the United States: Implications for enhancing and promoting HIV testing strategies. *Clinical Infectious Diseases*. 2007; 45:S213–S220. [PubMed: 18190289]
- Goldberg RW, Himmelhoch S, Kreyenbuhl J, Dickerson FB, Hackman A, Fang LJ, Dixon LB. Predictors of HIV and hepatitis testing and related service utilization among individuals with serious mental illness. *Psychosomatics*. 2005; 46:573–577. [PubMed: 16288138]
- Himmelhoch S, McCarthy JF, Ganoczy D, Medoff D, Dixon LB, Blow FC. Understanding associations between serious mental illness and HIV among patients in the VA Health System. *Psychiatric Services*. 2007; 58:1165–1172. [PubMed: 17766561]
- Himmelhoch S, McCarthy JF, Ganoczy D, Medoff D, Kilbourne A, Goldberg R, Blow FC. Understanding associations between serious mental illness and hepatitis C virus among veterans: A national multivariate analysis. *Psychosomatics*. 2009; 50:30–37. [PubMed: 19213970]
- Klinkenberg WD, Caslyn RJ, Morse GA, Yonker RD, McCudden S, Ketema F, Constantine NT. Prevalence of human immunodeficiency virus, hepatitis B, and hepatitis C among homeless persons with co-occurring severe mental illness and substance use disorders. *Comprehensive Psychiatry*. 2003; 44:293–302. [PubMed: 12923707]
- Lee HK, Travin S, Bluestone H. HIV-1 in inpatients. *Hospital & Community Psychiatry*. 1992; 43:181–182. [PubMed: 1572621]
- Maheshwari A, Ray S, Thuluvath PJ. Acute hepatitis C. *Lancet*. 2008; 372:321–332. [PubMed: 18657711]
- Meade CS, Sikkema KJ. HIV risk behavior among adults with severe mental illness: A systematic review. *Clinical Psychology Review*. 2005; 25:433–457. [PubMed: 15914265]
- Meyer I, McKinnon K, Cournos F, Empfield M, Bavli S, Engel D, et al. HIV seroprevalence among long-stay patients in a state psychiatric hospital. *Hospital & Community Psychiatry*. 1993; 44:282–284. [PubMed: 8444444]
- Meyer JM. Prevalence of hepatitis A, hepatitis B, and HIV among hepatitis C-seropositive state hospital patients: results from Oregon State Hospital. *Journal of Clinical Psychiatry*. 2003; 64:540–545. [PubMed: 12755656]

- National Institutes of Health Consensus Development Program. Management of Hepatitis C: 2002. National Institutes of Health Consensus Conference Statements. 2002; 19(3):1–46.
- Osher FC, Goldberg RW, McNary SW, Swartz M, Essock SM, Butterfield MI, Five-Site Health and Risk Study Research Committee. Substance abuse and transmission of hepatitis C among persons with severe mental illness. *Psychiatric Services*. 2003; 54:842–847. [PubMed: 12773598]
- Pirl WF, Greer JA, Weissgarber C, Liverant G, Safren SA. Screening for infectious diseases among patients in a state psychiatric hospital. *Psychiatric Services*. 2005; 56:1614–1616. [PubMed: 16339630]
- Rosenberg S, Goldberg R, Dixon L, Wolford G, Slade E, Himmelhoch S, Welsh CJ. Assessing the STIRR model of best practices for blood-borne infections in clients with severe mental illness. *Psychiatric Services*. 2010; 61(9):885–891. [PubMed: 20810586]
- Rosenberg SD, Drake RE, Brunette MF, Wolford GL, Marsh BJ. Hepatitis C virus and HIV co-infection in people with severe mental illness and substance use disorders. *AIDS*. 2005; 19(suppl 3):S26–S33. [PubMed: 16251824]
- Rosenberg SD, Drake RE, Wolford GL, Mueser KT, Oxman TE, Vidaver RM, Luckoor R. Dartmouth Assessment of Lifestyle Instrument (DALI): A substance use disorder screen for people with severe mental illness. *American Journal of Psychiatry*. 1998; 155:232–238. [PubMed: 9464203]
- Rosenberg SD, Goodman LA, Osher FC, Swartz MS, Essock SM, Butterfield MI, Salyers MP. Prevalence of HIV, hepatitis B, and hepatitis C in people with severe mental illness. *American Journal of Public Health*. 2001; 91:31–37. [PubMed: 11189820]
- Sacks M, Dermatis H, Looser-Ott S, Perry S. Seroprevalence of HIV and risk factors for AIDS in psychiatric inpatients. *Hospital & Community Psychiatry*. 1992; 43:736–737. [PubMed: 1516910]
- Satriano J, McKinnon K, Adoff S. HIV service provision for people with severe mental illness in outpatient mental health care settings in New York. *Journal of Prevention & Intervention in the Community*. 2007; 33:95–108. [PubMed: 17298933]
- Senn TE, Carey MP. HIV, STD, and sexual risk reduction for individuals with a severe mental illness: Review of the intervention literature. *Current Psychiatry Reviews*. 2008; 4:87–100. [PubMed: 18584060]
- Senn TE, Carey MP. HIV testing among individuals with a severe mental illness: Review, suggestions for research, and clinical implications. *Psychological Medicine*. 2009; 39:355–363. [PubMed: 18606051]
- Silberstein C, Galanter M, Marmor M, Lifshutz H, Krasinski K, Franco H. HIV-1 among inner city dually diagnosed inpatients. *The American Journal of Drug Alcohol Abuse*. 1994; 20:101–113.
- Solomon PL, Tennille JA, Lipsitt D, Plumb E, Metzger D, Blank MB. Rapid assessment of existing HIV prevention programming in a community mental health center. *Journal of Prevention & Intervention in the Community*. 2007; 33:137–151. [PubMed: 17298936]
- Srihari VH, Tek C, Chwastiak LA, Woods SW, Steiner JL. Best practices: Surveillance and management of diabetes in a CMHC population. *Psychiatric Services*. 2007; 58:1151–1153. [PubMed: 17766557]
- Stewart DL, Zuckerman CJ, Ingle JM. HIV seroprevalence in a chronically mentally ill population. *Journal of the National Medical Association*. 1994; 86:519–523. [PubMed: 8064902]
- Susser E, Valencia E, Conover S. Prevalence of HIV infection among psychiatric patients in a New York City men's shelter. *American Journal of Public Health*. 1993; 83:568–570. [PubMed: 8460736]
- Swartz MS, Swanson JW, Hannon MJ, Bosworth HS, Osher FC, Essock SM, Five-Site Health and Risk Study Research Committee. Regular sources of medical care among persons with severe mental illness at risk of hepatitis C infection. *Psychiatric Services*. 2003; 54:854–859. [PubMed: 12773600]
- U.S. Department of Health and Human Services. National Health Interview Survey (NHIS); Hyattsville, MD: 1998.
- U.S. Department of Health and Human Services. National Center for Health Statistics. Third U.S. National Health and Nutrition Examination Survey (NHANES III); Hyattsville, MD: 1998b.
- U.S. Department of Health and Human Services. Healthy people 2010. 2nd ed.. Vol. 2. U.S. Government Printing Office; Washington, DC: 2000.

- Volavka J, Convit A, O'Donnell J, Douyon R, Evangelista C, Czobor P. Assessment of risk behaviors for HIV infection among psychiatric inpatients. *Hospital & Community Psychiatry*. 1992; 43:482–485. [PubMed: 1587512]
- Walkup J, Satriano J, Hansell S, Olfson M. Practices related to HIV risk assessment in general hospital psychiatric units in New York State. *Psychiatric Services*. 1998; 49:529–530. [PubMed: 9550247]
- Zeber JE, Copeland LA, McCarthy JF, Bauer MS, Kilbourne AM. Perceived access to general medical and psychiatric care among veterans with bipolar disorder. *American Journal of Public Health*. 2009; 99:720–727. [PubMed: 19150912]